MARINE REVIEW.

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The Lost Atlantic Liner Elbe.

Readers of the REVIEW will be interested in particulars of hull and machinery of North German Lloyd steamship Elbe, sunk in collision with enormous loss of life on the 30th inst. in the North Sea off the coast of England, while bound for New York by way of Southampton. Particulars of the awful disaster have filled columns of newspapers. The Elbe, although not a very old boat, was the oldest of the North German Lloyd passenger steamers. She was built by the Fairfield Ship Building and Engineering Company of Glasgow in 1881, and was of 4,897 tons gross and 2,703 tons net, with a displacement of 6,350 tons at 20 feet draft. She was 418 feet long, 44 feet beam and 35 feet depth, and carried four masts and two funnels. Her engines were compound, having one 60-inch high pressure and two 85-inch low pressure cylinders, with a stroke of 60 inches. These engines were of 5,600 horse power, and were capable of driving the boat at a speed of 16½ knots. Other boats of the North German Lloyd line built since the Elbe are the Werra, Fulda, Eider, Ems, Saale, Aller, Trave and Lahn. We are indebted to E. F. Brown & Co., Cleveland agents for the line, for the cut of the Elbe.

Negotiations for Ships 420 Feet Long.

Managers of nearly all of the ship building companies on the lakes are still in communication with Pickands, Mather & Co. of Cleveland on the proposal made some time ago by the Minnesota Steamship Company to add three or four new vessels to its fleet of steel steamers. Plans as now considered by the steamship company are for two big steamers—420 feet long—and two schooners, all of the boats to include, on account of extraordinary dimensions, new and important features of construction. It is not at all probable that this contract, if let as now contemplated, will go to any one yard; neither is there any certainty of the contract, or any part of it, being let at all, but the managers of the steamship company have given a great deal of time and care to correspondence and consultation with ship builders.

A little figuring with reference to the tonnage now managed in the office of Pickands, Mather & Co. shows an enormous capacity for the fleet of forty-one vessels that will be operated from that office next season. The fleet will comprise twenty-seven whalebacks, eight Minnesota line steamers, the whaleback tow Pathfinder and Sagamore, steamer Kearsarge, and a steamer and two schooners now building at South Chicago. All of these are modern steel boats, and a conservative estimate of their capacity for the season of 1895 is 1,850,000 gross tons of ore. This figure is based on what is known of the work of the Minnesota steamers in past seasons, and includes an allowance of an even million tons for the whalebacks, admitting also that the barges take up about 300,000 tons of coal. The work of the barges last season was not within 200,000 tons or more of this estimate, but there is one new whaleback steamer to come out, and there is little doubt of the whole fleet doing better work in 1895. It is understood, however, that, as in the past, the barges will in part, probably two or three tows of them, be engaged exclusively in carrying ore for which Oglebay, Norton & Co. of Cleveland are sole agents.

Although the Globe Iron Works Company of Cleveland has given considerable attention to the matter of submitting bids to the Navy Department on the three torpedo boats, for which contracts are soon to be let, it is probable that they will not, after all, make much of an effort to secure the contract. After going to considerable expense in the preparation of special designs for machinery, the Cleveland company has received an order from the department requiring a great mass of plans, and other detail, that would require the attention of a big force of experts for a month or more, and which would involve additional expense, with chances against having matters in readiness at the time set for opening bids.

The engines to be built by the Cleveland Ship Building Company for the Interlake steamer and the Rhodes steamer will be duplicates, 23, 38 and 63 by 40 inches stroke. Engines for the Drake boat will be 20, 33 and 54 by 40 inches stroke, and those for the Duluth syndicate steamer will be 22, 38 and 63 by 40 inches. The Cleveland company will also build two boilers for the Interlake boat, 14 feet 8 inches by 13 feet, allowed 175 pounds; two 14 by 13 feet boilers, 170 pounds, for the Rhodes steamer, and two 12 feet 4 inches by 13 feet, 170 pound pressure boilers, for the Drake steamer. The boiler this company is building for F. W. Wheeler & Co. is 11½ by 12 feet.

Ore and Coal Situation.

All the details in the agreement as to prices and output being entered into by companies producing Bessemer ore, other than Messabi, in the Lake Superior mining region have not as yet been fully settled, and there is accordingly no indication of anything being done for some time to come in sales of ore for next season or the chartering of vessels for carrying ore. Producers of soft coal in the Hocking valley district (Ohio) have succeeded, after a series of meetings at Columbus, in placing all mines on the Hocking Valley Railway in a pool that was formed by six leading companies absorbing all of the smaller companies, and these six companies in turn forming what will be known as the General Hocking Coal Company, which will be entrusted with the sale and shipment of all coal coming from mines on the railway referred to. There is also in process a combination of mines on the Toledo & Ohio Central Railway, which includes such leading companies as the Northern Fuel Company, Sunday Creek Company and Phoenix Coal Company. It is not probable that these combinations will result beneficially to the lake carrying interests, as they will not, even if successful in holding together, be in a position to secure much of an advance in prices of either ore or coal, and the carrying trade will be subjected to the disadvantage of quite a large increase in the number of big new ships.

More Power for the Manitou.

The REVIEW is informed by the Lake Michigan and Lake Superior Transit Company that a contract has just been closed with the Cleveland Ship Building Company, to construct for the steamship Manitou four new Scotch boilers of the most approved pattern, each 11 feet diameter by 12 feet long, in order to substitute them for the boilers now aboard the Manitou. The management of the L. M. & L. S. T. Co. has ascertained that the steam capacity of the boilers now on board the Manitou was not sufficient to supply enough steam for her triple expansion engines, in order to work the same to the high rate of speed which was expected to be developed, and in order to accomplish the desired result, has decided to make the necessary changes. The new boilers will give the Manitou really more power then she requires, and it is expected that she will be able to develop a speed of from 18 to 20 miles per hour, thus making her one of the fastest boats on the lakes, an advantage which will in itself amply repay the company for the expense incurred.

A change will be made in the route of the Manitou with the opening of the passenger season this year. She will make three round trips each week between Chicago and Mackinac island, via Harbor Springs, Petoskey, Charlevoix, etc. This will give five sailings each week to and from Mackinac island in connection with the other steamers of the line.

Mr. Hill's Pacific Line.

"Jim" Hill, who violated the ethics of American railway construction by building a trans-continental line without government land or subsidy, and without stealing the capital, has for some time past had an eye on the Pacific end of his route, with a steamer connection to San Frencisco, and no one need be supprised if such a scheme is carried out when his lake line is completed and successful. If President Hill is able to centinue in his course as an upright man, which all hope, his works will become a great factor in checking the present methods of the great carrying corporations. He has the ability, and also the power, to force the trans-continental business to fairness, and to a basis of capitalization bearing some proportion to the real investment. The whole question turns on his individuality, and whether he prizes more the money of extortion, or the good opinion of his countrymen.—Industry, San Francisco.

C. L. Holmer, naval architect, formerly of Washington and Detroit, is now employed by the Cleveland Ship Building Company.

Officers of Lake Superior Mining Companies.

Only one change was made in the directory of the Metropolitan Land and Iron Company (Norrie) for 1895. Francis Hinton takes the place on the board rendered vacant by the death of Capt. Clement. Directors re-elected were: S. S. Curry, Ironwood, Mich.; O. W. Potter, Chicago; L. J. Pettit and John A. Whaling, Milwaukee. The directors elected these officers: President, S. S. Curry; treasurer, L. J. Pettit; secretary, H. S. Haselton.

Directors of the Aurora Iron Company, Milwaukee, are: Charles F. Rand, Fred T. Gates, James Colgate, Chas. L. Colby, Edwin H. Abbott, W. J. Olcott, and L .H. Severance. Officers: President and treasurer, Charles F. Rand; secretary and general solicitor, Howard Morris.

Directors and officers of the Brotherton Mining Company, also elected a few days ago at Milwaukee, are Joseph Sellwood, M. J. Luther, H. Neidecken, Edward Neidecken, J. B. Tubbs, Arthur Pugh and Robert Bowden, directors: Joseph Sellwood, president; H. Neidecken, vice president; M. J. Luther, treasurer; Edward Niedecken, secretary. It is probable that the Brotherton and Sunday Lake mines will both be operated again in the spring.

Fuel Consumption of Big Atlantic Liners.

Editor MARINE REVIEW: A reprint of a short article from Cassiers' Magazine in your issue of Jan. 24, entitled, "Coal Burned on a Big Atlantic Liner," is interesting, and if true, would be startling. The writer assumes that ships of the class of the Paris or Campania consume 2 pounds of coal per I. H. P. per hour. In point of fact the coal consumption of the Paris is closer to 1.5 pounds of coal per I. H. P. per hour than to 2 pounds.

The consumption of coal of the Paris per day on which he bases his argument at 350 tons is more nearly 300 tons as an average during the best season when the fastest time is made. There is no reason to doubt that the Campania and Lucania are developing an I. H. P. on 1.4 pounds of coal per hour, which would make about 420 tons per twenty-four hours, with an addition say of 30 tons for other purposes, such as galley, etc., or a grand total of 450 tons per day at sea.

The steamship Pennsylvania, another boat under the same ownership as the Paris, has made a record for a whole passage at as low a rate as 1.33 pounds of coal per I. H. P. per hour, and her average for a year's work will probably come under 1.5 pounds. Both the Paris and the Pennsylvania are fitted with the Howden system of hot draft, and the latter with Serve tubes, which partially account for their economy.

Another interesting feature in the economy of the Paris was shown several years ago when the Worthington patent marine feed heaters were installed. A saving of 26 tons of coal per day was shown by their use, which was gained as follows: Say the engines developed 20,000 I. H. P. and consumed 15 pounds of steam per I. H. P., the temperature of the water before the heaters were put in was about 120°. The heaters increased this 90°, which amounts to a saving of 27,000,000 heat units per hour, and assuming that one pound of coal will give out 11,000 heat units, the saving would be about 2,460 pounds of coal per hour. Figuring on the economy that will be gained on the new American liners now being constructed at Cramps' by the use of Howden hot draft, Serve tubes and Worthington marine feed heaters, it would not require a great stretch of the imagination to believe that an I. H. P. will be developed on about 1.25 pounds of coal, after the boats have gotten into smooth running order.

W. D. KEARFOTT,

CLEVELAND, Jan. 26, 1895.

Masters May Telegraph for Weather Information.

Mark W. Harrington, chief of the weather bureau has just issued a circular, of which the following is an extract:

"Wind signal displayment at stations on the great lakes are authorized to telegraph for information regarding expected weather conditions in their vicinity whenever such information is requested by masters of vessels flying the American flag. From stations on Lakes Superior, Michigan, or Huron, these requests will be addressed to the weather bureau office, Chicago; from stations on Lakes Erie or Ontario to the weather bureau office, Buffalo. Masters of this class of vessels, whenever at a port on the great lakes, where there is no weather bureau office or wind signal display station, may themselves telegraph for this information, observing the same rule as to territory as given above. The telegram should be addressed simply: 'Weather, Chicago,' or 'Weather, Buffalo.' These messages and the answers thereto will be at government expense, but it is expected that the privilege herein granted will only be exercised when the information sought is regarded as necessary for the safety of the vessels concerned. It is also expected that vessel masters who avail themselves of this privilege will make public the information thus obtained for the benefit of all vessels in their vicinity."

Great Britain's new battleships Powerful and Terrible will each carry a crew of 894 officers and men, a number considerably in excess of that of any battleship afloat.

Grand Opportunity for Water Tube Boiler Tests.

Now that a lake ship building concern, the Chicago Ship Building Company has formally closed a contract for water tube boilers of the Babcock and Wilcox type for a freight ship of 380 feet keel, and is also building a duplicate steamer that is to be fitted with Scotch boilers, it would seem that the bureau of steam engineering, navy department, may be afforded, through the progressive spirit of the owners and builders of the Chicago boats, an opportunity to present some practical and reliable information on a subject that is attracting special attention, not only in this country but throughout European ship building centers. It will be remembered that immediately following the completion of the Northern Steamship Company's big passenger steamer North West, Engineer-in-Chief Melville of the navy department sought from the builders and owners of the boat their consent to have a board of naval engineers make observations and report upon the operation of the Belleville tubulous boilers of the North West in actual service. The Globe Iron Works Company, builders of the North West, agreed to Commodore Melville's request, but the investigation was not carried out, on account of the objection from Mr. Miers Coryell, who represented in this country the French owners of patents on the Belleville generators.

In the Chicago boats there is the additional important advantage of comparison between the two types of boilers in boats of similar length, tonnage and engine power, and the REVIEW is very much mistaken if all parties in interest in this case—builders of hulls, engines and boilers—will not afford in the engineer-in-chief of the navy every opportunity to learn what there is in water tube boilers, if he seeks the privilege. Such action on the part of Commodore Melville would result in the navy department securing information that is now eagerly sought in the engineering world, and would at the same time direct attention to the enterprise of lake builders of ships and machinery in boldly adopting the latest practice in their line.

The builders as well as the Duluth and Chicago owners of the big steamer that is to be fitted with the Babcock and Wilcox tubulous boilers have gone into the matter fully realizing that they are taking risks, but they feel themselves safe in the hands of the boiler company, and they have certainly shown progressiveness in the desire to test the merits of the boilers. Their action offers the best opportunity that has ever been presented to ship owners and naval authorities to technically and commercially decide what is to be best suited for marine and naval requirements.

Mr. Charles Wilson who is located at Minneapolis and who represents the Babcock and Wilcox Company on the lakes, has had most to do with the contracts through which that company has created quite an interest in the boiler question here. He set out in October last to get two boats a passenger steamer and a first-class freight carrier, on which to try the boilers. He has accomplished the task with the assistance of Mr. McElroy, owner of the fast river passenger steamer Unique, and the owners and builders of the Chicago freighter.

It has been suggested, owing to the similiarity of his name to that of the late senior member of the Babcock and Wilcox Company, that Mr. W. I. Babcock of the Chicago Ship Building Company is in some way connected with the boiler manufacturers. Mr. Babcock would probably not object to being connected with a firm of the engineering and commercial reputation of the Babcock and Wilcox company, but he is not associated with them in any way.

National Organization, M. E. B. A.

Delegates from the lakes who attended the national convention of the Marine Engineers' Beneficial Association in Washington last week will have nothing of special interest to report to the local organizations, although the national body gave up a full week to the discussion of routine matters that require attention each year. Officers elected for 1895 are: National president, Geo. Uhler, of Philadelphia; national vice president, J. J. Searey, of San Francisco; national secretary, T. F. Dowd, Chicago, and national treasurer, J. J. A. Williams, of New Orleans.

General Dumont of the United States steamboat inspection service again spent a part of one session with the engineers. He was asked a number of questions bearing upon such subjects as that of an engineer being an officer of a steam vessel. His answers were in most cases not of the kind that satisfied the engineers, as he was very careful not to commit himself in important matters before the treasury department, but his visit was a pleasant one as usual, and there was no truth in the Washington dispatches to the New York Herald stating that the engineers were in Washington to seek his removal. The Herald is opposing the supervising inspector-general, and its Washington correspondent took the opinions of individuals as an expression from the organization of engineers, which was of course an error, as was the case also with what was said on the same subject about representatives of the Shipmasters' Association and the Lake Carriers' Association, who were in Washington recently.

Principal Features of New Navigation Laws.

The White bill which contains the legislation sought for some time past by lake vessel owners and masters, and which is the same as that introduced by Mr. Burrows in the senate, is numbered H. R. 8,635. The bill contains nothing to prohibit the use of passing signals in any kind of weather, and aside from this its most important provisions in which changes are involved have reference to fog signals. The full text of the fog signal rules is as follows:

FOG SIGNALS.

RULE 14. A steam vessel shall be provided with an efficient whistle, sounded by steam or by some substitute for steam, placed before the funnel not less than 8 feet from the deck, or in such other place as the local inspectors of steam vessels shall determine, and of such character as to be heard in ordinary weather at a distance of at least two miles, and with an efficient bell, and it is hereby made the duty of the United States local inspectors of steam vessels when inspecting the same to require each steamer to be furnished with such whistle and bell. A sailing vessel shall be provided with an efficient fog horn and with an efficient bell. Whenever there is thick weather by reason of fog, mist, falling snow, heavy rainstorms, or other causes, whether by day or by night, fog signals shall be used as follows.

(a) A steam vessel under way, excepting only a steam vessel with raft in tow, shall sound at intervals of not more than one minute, three distinct blasts of her whistle.

(b) Every vessel in tow of another vessel shall, at intervals of one minute, sound four bells on a good and efficient and properly placed bell as follows: By striking the bell twice in quick succession, followed by a little longer interval, and then again striking twice in quick succession (in the manner in which four bells is struck in indicating time.)

(c) A steamer with a raft in tow shall sound at intervals of not more than one minute a screeching or Modoc whistle for from three to five seconds.

(d) A sailing vessel under way and not in tow shall sound at intervals of not more than one minute—

If on the starboard tack with wind forward of abeam, one blast of her fog horn;

If on the port tack with wind forward of the beam, two blasts of her fog horn;

If she has the wind abaft the beam on either side, three blasts of her fog horn.

(e) Any vessel at anchor and any vessel aground in or near a channel or fairway shall at intervals of not more than two minutes ring the bell rapidly for three to five seconds.

(f) Vessels of less than ten tons registered tonnage, not being steam vessels, shall not be obliged to give the above mentioned signals, but if they do not they shall make some other efficient sound signal at intervals of not more than one minute.

(g) Produce boats, fishing boats, rafts, or other water craft navigating by hand power or by the current of the river, or anchored or moored in or near the channel or fairway and not in any port, and not otherwise provided for in these rules, shall sound a fog horn, or equivalent signal, at intervals of not more than one minute.

RULE 15. Every vessel shall, in thick weather, by reason of fog, mist, falling snow, heavy rain storms, or other causes, go at moderate speed. A steam vessel hearing, apparently not more than four points from right ahead, the fog signal of another vessel shall at once reduce her speed to bare steerageway, and navigate with caution until the vessels shall have pa ssed each other.

In General.

The Illinois Steel Company has about completed at South Chicago its ship plate and boiler plate plant. Buildings are now being equipped with the necessary machinery.

Sir Henry Bessemer, the father of the steel industry, who is in his eighty-fourth year, has nearly completed his autobiography, on which he has been engaged for the past year.

It is expected that the ship-canal between the Baltic and the North sea, which is one of the greatest of modern strategic and commercial works, will be opened for traffic by the close of the present year.

An indicator, which it is claimed will accurately inform navigators when a vessel is out of her course, has been invented by Captain Prince Louis of Battenberg of the British navy. The device has been tested by the admiralty, who have ordered that it be supplied to the British warships.

John Stevens, son of the late A. E. Stevens, and one of the younger members of the well-known Stevens family of Hoboken, N, J., died at his home in that city a few days ago. He was a director of the Hoboken Ferry Company and was interested in other enterprises in and around New York.

A newspaper clipping bureau recently forwarded to the Cramps of Philadelphia an enormous scrap-book, containing clippings relative to the launch of the American line steamship St. Louis. If pasted together in a straight line, the reading matter and pictures in the book would extend three-quarters of a mile.

In a late issue of the American Shipbuilder, New York, McBride Bros. of Philadelphia, owners of the fast steam yacht Yankee Doodle, suggest a a race over a course of 90 or 100 miles, to take place on the North river, New York, about the opening of the yachting season, between such boats as the Vamoose, Norwood, Rex and Yankee Doodle, which were built altogether for speed. These small boats belong to the class of fine-modeled, high-powered steam craft for which records exceeding thirty miles an hour are claimed. The Philadelphia firm seems earnest in its proposition, but it is doubtful whether the question of superiority will ever be settled between the several owners.

An extract from the Detroit (Mich.) Advertiser of Nov. 7, 1839, giving an account of a fast through passenger service which was then established between New York and St. Louis, contains the following schedule: From New York you of course take the steamboat to Albany, say, 12 hours; railroad to Auburn, 12 hours; swiftsure line to Rochester, 8 hours; railroad and stage to Buffalo, 9 hours; steamboat to Chicago, 5 days; stage to Peru, 12 hours; steamboat to St. Louis, good water, 24 hours; total time 8 days 5 hours. The item concludes with this statement: "Thus is Yankee enterprise annihilating space and bringing the two extremes of the new world into close approximation."

Portugal proposes to obtain a modern navy in a novel manner. First-class ship builders are to be asked how many vessels of specified types they will supply a year, for twenty years or less, in consideration of $550,000 a year and certain monpolies. The award will go to the firm that offers the most in the least time and for the shortest period of monopoly. The government ship yards will be closed and one yard established at Lisbon, to which all the existing machinery and operatives will be sent. The plant, material and fuel will be free from duty; all repairing work for the government, both in Europe and the colonies, will go to the new establishment. The cruisers are to be of wood, copper sheathed. There are to be ten destroyers of the Havoc type.

Cargo and Speed Records.—Lake Freight Steamers.

Iron ore.—S. S. Curry, Hawgood & Avery Transit Company of Cleveland, 4,569 gross or 5,117 net tons, Escanaba to South Chicago; Maritana, Minnesota Steamship Company of Cleveland, 4,260 gross or 4,771 net tons, Escanaba to South Chicago; Selwyn Eddy, Eddy Bros. of Bay City, Mich., 3,897 gross or 4,364 net tons, Escanaba to Ashtabula; Kearsarge, Interlake Company of Cleveland, 3,718 gross or 4,164 net tons, Escanaba to Cleveland.

Grain.—Selwyn Eddy, Eddy Transportation Company of Bay City 130,820 bushels of wheat, Detroit to Buffalo; Centurion, Hopkins Steam ship Company of St. Clair, Mich., 147,812 bushels of corn, Chicago to Erie; Onoko, Minch estate of Cleveland, 187,657 bushels oats, Chicago to Buffalo.

Coal.—S. S. Curry, Hawgood and Avery Transit Company of Cleveland, 4,535 net tons bituminous, Conneaut to Gladstone; Selwyn Eddy, Eddy Bros. of Bay City, Mich., 4,252 net tons anthracite, Buffalo to Milwaukee.

Speed.—Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 45 hours and 16 minutes, 16.4 miles an hour; Centurion, Hopkins Steamship Company of St. Clair, Mich, Buffalo to Duluth, 997 miles, 67 hours and 50 minutes, 14.7 miles an hour.

Around the Lakes.

In other parts of this issue Gen. Poe and Col. Smith, army engineers on the lakes, ask for bids on river and harbor work that will interest contractors.

President Cleveland's nomination of John H. Galwey, supervising inspector of steam vessels at Detroit, has finally been confirmed by the senate.

Buffalo officers of the Northern Steamship Company say there is not a shadow of cause for the report that John Gordon, general manager of the company, who is now in St. Paul, has resigned.

Louis Nixon, naval architect, who recently leased the Crescent ship yard at Elizabethport, N. J., is to retain connection with the Cramps of Philadelphia simply in a consulting capacity. He will be succeeded as superintendent in the Cramp yard by A. J. Brooks, who resigns a place in the bureau of construction, navy department.

"SAILING DIRECTIONS FOR LAKE SUPERIOR, ST. MARY'S RIVER AND STRAITS OF MACKINAC" IS A PUBLICATION JUST ISSUED BY THE UNITED STATES HYDROGRAPHIC OFFICE. IT IS FAR IN ADVANCE OF PUBLICATIONS OF THE COAST PILOT KIND. PRICE $1. ADDRESS MARINE REVIEW, 516 PERRY–PAYNE BUILDING, CLEVELAND, O. WE HAVE NO HESITANCY IN RECOMMENDING THIS BOOK.

Criticism of Appropriations for Western Rivers.

Every time a civil sundry appropriation bill is presented in congress, the appropriations for river and harbor works of the continuous contract kind, which are carried each year in this bill, are attacked in one way or another by members who are more or less opposed to expenditures for river and harbor purposes. It is noteworthy, however, that in none of these debates have the lake works that are being carried on under the contract system been criticised. These are the new St. Mary's Falls canal lock and approaches, Hay lake channel and the 20-foot channel improvements. The merits of these works protect them from criticism of any kind, but such has not been the case with the Mississippi and Missouri river works, upon which the expenditures have been away up in the millions. In four years there has been expended on fifteen works included in the contract system about $47,000,000, the great bulk of which was for western rivers, Galveston and Philadelphia, the works on the lakes involving thus far probably not more than one-eighth of the total. It is not surprising, therefore, that the lake works do not meet with the opposition that always shows itself when the Mississippi and Missouri river appropriations are under consideration. During discussion of the civil sundry bill, which has just passed the house, Mr. Hepburn of Iowa brought out the usual criticism of the river work by engaging in debate Mr. Sayers of Texas, chairman of the appropriation committee, and Mr. Catchings of Mississippi, who is recognized as a defender of the river interests. The debate as reported in the Record is quite interesting. Mr. Sayers made the statement that appropriations, amounting to about $8,000,000 next year, will result in dropping from the civil sundry bill all appropriations for contract river and harbor works.

Mr. Hepburn—I desire to ask the chairman of the committee a question. I would like to call his attention to the three items for the improvement of the Mississippi river, from the mouth of the Ohio north, and from the jetties to the Ohio, and the improvement of the Missouri from its mouth to Sioux City. Those three items aggregate something more than $5,000,000. Now, I want to ask him if, in his judgment, those improvements belong to the class that he has just spoken of as dropping out? In other words, does he not believe, from his knowledge of the methods of improvement and of the consequent necessity for repairs, that those are continuing expenditures, and that the same necessity for them will exist twenty-five years from this date that exists to-day?

Mr. Sayers—That may be so, but what I meant by "dropping out" was that the appropriations for these purposes would cease to appear in the sundry civil bill. That is to say, the appropriations committee would cease hereafter, unless further authorized or directed by congress, to report these appropriations. Congress authorized the committee to make appropriations for the purposes named by the gentleman for three years, and we are appropriating now for the third year, so that unless there should be other legislation the appropriations for the Mississippi river will hereafter appear upon the river and harbor bill.

Mr. Hepburn—I wish to ask the gentleman another question. If you were to eliminate the items of timber rafts and coal from the traffic on the Mississippi and Missouri rivers do you not believe that these appropriations largely exceed the entire freight receipts by all the steamers doing business on the two rivers?

Mr. Catchings—I will answer that question if the gentleman will give me the opportunity.

Mr. Sayers—I will say frankly to the gentleman that the committee on appropriations has not been called upon to obtain that information. The committee was simply required, under the rules of the house and the action of congress, to report certain specific appropriations, and they have done so. The gentleman from Mississippi (Mr. Catchings), who is better informed than I am as to the subject about which the gentleman from Iowa inquires, states that he will answer the gentleman's question.

Mr. Catchings—My friend's supposition is entirely without foundation.

Mr. Hepburn—The gentleman says, very gratuitously I think, that my statement is without foundation. Has he any facts that he can bring to bear upon this question?

Mr. Catchings—Yes, sir. If the gentleman will take the trouble and do me the honor to refer to some observations which I submitted on that point during the last session of congress, he will find certain facts bearing upon this subject. I have not the facts before me at this moment.

Mr. Hepburn—Recollect that in my query I eliminated two great items of traffic.

Mr. Catchings—So did I.

Mr. Hepburn—Now, is the gentleman prepared to say that the entire freight receipts of all the steam boats doing business on those two rivers, leaving out the items of coal and timber rafts, during the year, is equal to the appropriation carried in this bill?

Mr. Catchings—Mr. Chairman, I am not a business man in one sense, and I do not know what steamboats charge for carrying passengers and freight; but I do know that there is an enormous amount of freight and that there are a great many passengers carried on the Mississippi river, all along from St. Paul to New Orleans. I know that there is an enormous traffic on the Mississippi river.

Mr. Hepburn—I notice an appropriation here of over $700,000 to enable the Missouri river commission to continue their work from the mouth of the river to Sioux City. The city of Council Bluffs is perhaps midway that distance, and I undertake to say that in the last eight years not a single loaded steamboat has passed the point of Council Bluffs going up or down. I remember not many years ago noticing this appropriation; I have not investigated it this year. The appropriation of $375,000 was, by its terms, to be expended continuously from the mouth of the river up stream, provided, however, that at certain points—eleven being named—this appropriation might be expended in such sums as might be considered proper by the commission. When you looked at the map you found that those eleven places named were the sites of railroad bridges and the expenditures there were made solely for the purpose of preserving the abutment of those bridges. The gentleman will allow me to remind him that a few years ago, when he first became a participant in the discussions upon these bills, he and his associates utterly refused to admit that any part of these expenditures were to be made for the preservation of private estates along the Mississippi river. How sedulously you gentlemen then refused to say or to admit that a dollar of these appropriations was to be expended for the purpose of building and maintaining the levees. Emboldened by long years of success, you now do not hesitate to place in the bill provisions for the maintenance of levees along the river, levees that are intended solely to protect the private estates of planters who live upon the banks of the Mississippi. I do not hope that anything I can say will check these expenditures, extravagant, outrageous, inefficient as they are. Under pretence of improving the Mississippi river and its navigation you will go on making your improvements, at a cost sometimes of $50 a lineal foot in the places where you rectify the channel at all. I want to call attention at least to the change of face of my friend from Mississippi, who no longer pretends that this legislation is for the improvement of the river, but is willing to admit that it is for the improvement of the farms along the river. I would be glad if these gentlemen when they ask us to make these appropriations would state frankly, as they are beginning to do now, the real reason, and not attempt to cajole me and others into making appropriations of this kind under the pretence that we are improving the river. The gentleman has an entirely different idea of the improvement of the river from that which I have. He and I adopt an entirely different construction as to the meaning of "improvement of navigation." I want the navigation improved; he wants the possibility of cultivation upon the borders improved.

Mr. Catchings—Mr. Chairman, I do not intend to engage in a quarrel with my distinguished friend from Iowa [Mr. Hepburn.] This is an old fight between him and me, which is now renewed, very much to my regret. I thought we had fought it out and finished it years ago; and my mind went back to the days when, as a young member, I was very much terrorized by the animation with which the gentleman uttered these same sentiments. But I had hoped that now, after a season of retirement from congress, his mind had got into a state of repose which would make him look with some complacency upon our struggles in the Mississippi valley. And even now I am bound to express my regret that we can not have a gentleman of his ability and his earnestness always to help us to accomplish the great work we are trying to perform. It is not true, as my friend states, that the sole object of this appropriation for the Mississippi river from Cairo to the Gulf is to protect the farm lands along the banks of that river. Incidentally those farm lands do derive great protection, and that I think should be a matter of congratulation to members of this congress. My friend must remember that without these levees there is scarcely a foot of land in the Mississippi valley from Cairo to the Gulf that would not be inundated at times of high water. I make this statement broadly, and it carries a great deal of significance with it."

Retirement of the Western Transit Company and the Anchor line from lake passenger business probably depends now, as it has in the past, on sale of the passenger boats of the line, but the longer the boats are held and operated for whatever little advantage there is in them to the Buffalo companies, the less chance there is of a sale of them. It is reported that the Western line boats, Empire State, Badger State and Idaho, could be purchased for $100,000, but some improvements are being made on the Anchor liners, India, China and Japan, and this would indicate that there is little probability of their being sold or retired from lake business.

Mr. Albert Fisher, Monadnock block, Chicago, was accompanied on a visit to Cleveland, last week, by Manville White, engineer of tests with the Bethlehem Iron Company, South Bethlehem, Pa. Mr. Fisher represents the Bethlehem company on the lakes, and Mr. White, who is an expert on steel, joined him in consulting lake ship builders, with a view to having them adopt steel as against iron forgings in ships' machinery.

Season's Work of the Menominee and Mutual Steamers.

In the following tables some extracts are made from the annual statements covering the operation of the steel ore carriers of the Menominee and Mutual transportation companies during the season of 1894. These steamers, excepting the Cambria, are practically of the same dimensions. They are controlled and operated in the office of M. A. Hanna & Co., Cleveland. The Menominee boats are 316 feet over all, 296 feet keel, 40 feet beam and 24 feet moulded depth, while the Corsica and Corona are 4 feet shorter. The Cambria, the third boat of the Mutual fleet, is 280 feet keel, 300 feet over all, 38 feet beam and 24 feet moulded depth. The engines in all cases have cylinders 24, 38 and 61 inches by 42 inches stroke and they are of about 1,200 I. H. P. The boilers, the dimensions of which in the case of all excepting the Cambria are 12½ by 14 feet, are of Scotch type, and supply steam at 160 pounds pressure. The Mutual boats have connected air pumps, while the pumps of the Menominee boats are independent.

PERFORMANCE OF MUTUAL TRANSPORTATION COMPANY'S STEAMERS, OF CLEVELAND, SEASON OF 1894.

	Cambria.	Corsica.	Corona.
Number of trips	26	26	26
Hours run	2,944	2,982	2,842
Miles run	35,565	37,565	34,240
Miles run per hour	12.08	12.59	12.05
Ore carried, gross tons	64,327	68,340	69,342
Coal carried, not tons	11,975	4,930	15,872
Grain carried, gross tons	.....	.....	.....
Ore carried, average tons per cargo	2,474	2,628	2,667
Fuel, number of tons, net	3,691	3,967	3,585
Fuel, average pounds per mile	208	211	209
Lubricants, average cost per mile	80-100 cts.	70-100 cts.	68-100 cts.
Total time handling cargoes and fuel	78 d. 20 h.	42 d 20½ h.	65 d. 21½ h.
Lost time, repairs, dry dock, etc	15 h. 30 m.	14 days.	6 h. 57 m.
Engineers' supplies and repairs, cost	$204.74	$171.46	$81.09
Lost time, account of weather	6 d. 12½ h.	3 d. 6 h.	1 d. 23 h.

PERFORMANCE OF MENOMINEE TRANSIT COMPANY'S STEAMERS, OF CLEVELAND, SEASON OF 1894.

	Norman	Saxon.	German	Briton.	Grecian	Roman.
Number of trips	22	22	23	21	21	22
Hours run	3,426	3,133	3,233	2,955	3,167	3,233
Miles run	37,668	36,175	39,726	35,991	37,826	37,700
Miles run, per hour	12	11.55	12.29	12.18	11.94	11.66
Ore carried, gr. tons	53,682	53,281	54,860	50,617	48 551	52,322
Av. tons ore per cargo	2,529	2,480	2,385	2,841	2,312	2,378
Coal carried, net tons	12,644	7,440	7,912	15,864	10,006	12,472
Tons fuel, net	4,076	3,866	4,564	3,822	4,191	3,888
Fuel av. lbs. per mile.	216	214	230	213	222	206
Lubricants, av. cost per mile	66-100 cts.	66-100 cts.	73-100 cts.	67-100 cts.	75-100 cts.	83-100 cts.
Total time handling casgoes and fuel	64d. 1h.	48d. 3½h.	60d.20½h	65d. 16h	45d. 19h.	51d 5½h.
Lost time, repairs, dry dock, etc	.....	3d. 1h.	6¾ h.	5d. 20h.	6d. 11¾h.	.....
Engineers' supplies and repairs, cost	$81.08	$111.92	$184.85	$96.66	$127.71	37.52
Lost time, weather	4d.	5d. 15½h.	4d. 14h.	5d. 4½h.	5d. 17h.	3d. 6½h.

How Appropriations for Lights are Blocked.

Evidently Mr. Sayers of Texas, chairman of the house committee on appropriations, is not a very warm friend of lake interests in congress. In one instance, while the civil sundry appropriation bill was under consideration a few days ago, Representative Daniels and other congressmen from the lake states made an effort to introduce, as amendments to the bill in the house, appropriations for a few aids to navigation that were authorized by congress in 1893, but which were not included in the bill by the committee. A trial was made on an appropriation of $15,000 for a light on the pier at Grand Marais harbor of refuge, Lake Superior. It was admitted that the light had been authorized, and that the government had expended $368,000 on a harbor at Grand Marais, which is not lighted. These were strong arguments in favor of the amendment to the bill, but Mr. Sayers, who had the measure in charge, and was accordingly afforded the support of an uninterested majority in the house, on the principal of supporting committee reports, opposed the appropriation to the end.

When pressed with the very good arguments of Mr. Daniels and others who supported the amendment, Mr. Sayers declared that the light at Grand Marais was one of the fifty-three light houses that were log rolled through the house two years ago, under what was known as the omnibus bill. "A combination was formed," he added, "I suppose at the instance of the Lake Carriers' Association and others, and a bill was put through the house carrying fifty-three light houses and other structures of kindred character." He quoted Robley D. Evans, ex-naval secretary of the light house board, as saying with reference to these lights which the vessel owners worked so hard to secure: "They are the light houses appropriated for under what was known as the omnibus bill, which was forced through congress by the Lake Carriers' Association, and never were approved by the light house board."

The proposed amendment was defeated, but in bringing about its defeat Mr. Sayers seems to have gone out of his way to get in a fling at the Lake Carriers' Association. The quotation credited to Commander Evans is from a letter to Mr. Sayers. It shows how certain naval officers in the light-house board, while professing support for aids to navigation on the lakes, have quietly fixed matters with members of appropriation committees. There is no public record of the light-house board ever having disapproved of any of the aids to navigation on the lakes that were authorized by the bill of two years ago.

The New Navigation Rules.

In another part of this issue there is printed the main features of the measure now before congress which provides a special code of rules for preventing collisions in lake navigation. Although important matters in congress have prevented action on this measure, since representatives from the organizations of vessel owners and masters on the lakes arrived at a full and satisfactory conclusion several days ago, with senate and house committees and with the heads of departments in Washington, Attorney Harvey D. Goulder, Capt. W. S. Mack and others who have had charge of the matter, say there is no doubt of the rules being adopted just as the lake interests desire them. The committee that visited Washington expect full support from Gen. Dumont of the steamboat inspection service and Mr. Chamberlain, commissioner of navigation, as these gentlemen afforded them every advantage in meeting and dealing with congressional committees, and when the bill was finally arranged expressed on their own account general approval of its provisions. It is, of course, understood that the only changes in the lake rules of special importance have reference to fog signals and to the elimination of legislation prohibiting the use of passing signals in fog.

Miscellaneous Mention.

Capt. R. C. Soper has been appointed harbor master at Buffalo to succeed Capt. James Doyle.

M. E. B. A. No. 2 of Cleveland are again preparing for their annual ball and banquet, to be held at Merrill's hall on February 11. This will be the eleventh annual social gathering of the organization.

L. L. Stoddard of Milan, O., bought the steamer M. Groh at marshal's sale in Sandusky, Saturday, for $2,500. The Groh belonged to the estate of John T. Johnson of Sandusky, who paid $13,000 for her in 1890.

Temporary embarrassment of the Bucyrus Steamship and Dredging Company of South Milwaukee has caused the appointment of Howard P. Eells of Cleveland and John S. George of Milwaukee as receivers.

Under the contract with Pickands, Mather & Co. for the management of the whaleback vessels during 1895, the American Steel Barge Company retains the right to have Capt. Alex McDougall make all appointments of masters and look after repairs.

Major James F. Gregory, corps of engineers, U. S. A., stationed at Milwaukee, has been granted a leave of three months from duty, the Milwaukee office to be in charge, in the meantime, of Capt. Carl F. Palfry, who has of late been under the immediate orders of Gen. Poe, Detroit.

Engineer Robert McClure of Benton Harbor, Mich., who was lost on the steamer Chicora, had probably seen more years of active service in the engine room than any engineer now on the lakes. He was an engineer when John F. Pankhurst, Thomas Fitzpatrick, Tom Coe and other veterans followed the lakes.

Another of the McMyler car dumping machines is being built by the McMyler Manufacturing Company of Cleveland, under a contract with the Pittsburg, Fairport and Northwestern Dock Company. The machine will be erected at Fairport in time for service next season, and although of about the same size as the Ashtabula machine, it will be of somewhat greater capacity, as it will be operated more rapidly.

In Buffalo, a few days ago, the wooden steamer Pringle and consorts Harrison and Sweetheart, together with the steel steamer Emily P. Weed, were sold under mortgage foreclosure at $140,000. The price is remarkable, although it is of course understood that the purchasers, members of the Hollister Transportation Company, were owners of the boats and simply bid them in, whatever the result may be. It is certain, though, that in better times there would have been interest enough in the sale to cause an attendance that would result in a higher price being made. The Weed alone cost $230,000 when built by F. W. Wheeler & Co., a few years ago.

IF YOU SEND $1. TO THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O., FOR FOUR STEEL ENGRAVINGS OF U. S. WAR SHIPS, ON HEAVY CARD, AND ARE NOT SATISFIED WITH THEM, WE WILL REFUND THE MONEY.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642 50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	104,515.00
" " " 1891	204	111,856 45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893.	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of Navigation	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

PROFESSOR G. FREDERICK WRIGHT of Oberlin college has given many years of study to the geology and geography of the lake region. Mr. Wright has been lecturing in Cleveland of late on the drainage system of North America. In one of his lectures on Monday last he spoke of the probable effect of the Chicago drainage canal on lake levels. On the strength of the conclusions reached by Major Ruffner, corps of engineers, U. S. A., stationed at Buffalo, Professor Wright is of the opinion that the shipping interests of the lakes should oppose the drainage canal work, as he says it will disturb the established balance of nature's forces on the lakes, and during periods of low water cause a perceptible difference in the draft of water that may be used by vessels in shallow channels. He presented no new features of this subject, which has attracted attention throughout the lake region since the Chicago drainage canal was first proposed, but he accepted as facts the statements of the opponents of the canal, to the effect that the levels of Lake Michigan, Huron, Erie and connecting waters will be lowered about 9 inches by the outflow at Chicago. He made no reference to criticisms of the Niagara outflow determinations, upon which the 9 inches of fall in lake levels is based; neither did he say anything of late statements credited to Gen. Casey, chief of engineers, U. S. A., who has discouraged the appointment by congress of a commission of engineers to investigate the whole lake outflow question, brought up by the drainage canal discussion, and who is reported as saying that the outflow at Chicago will not be sufficient to warrant any attention from the government engineers who have been carrying on great works of improvement throughout the lakes. Professor Wright's lecture was made interesting by the graphic manner in which he compared the lakes, which are high above sea level, to an immense saucer, full of water, held in the air upon a tender balance, the slightest variation of which would result in the water flowing over the edge of the vessel. The level of the lakes, he said, is such that if the continent was to dip 50 feet to the west all the water which now goes over Niagara would flow over the Chicago divide, through which the drainage canal is being cut, and if the dip were 100 feet to the north the water of the lakes would go through Lake Nipissing into the Ottawa river, leaving Niagara dry. This and similar statements affording opportunity for a variety of thonght were pleasing features of the lecture, but no points were brought out or suggested that have not already been very fully discussed by engineers who are more or less interested in the subject.

NOW THAT there is a probability of the Nicaragua canal project becoming a reality, interest in the great scheme is increasing throughout the country, and it is not at all unlikely that in event of the measure that passed the senate a few days ago becoming a law, some of the contractors who have been engaged in big channel and canal improvements on the lakes will be heard from in connection with building of the Central American waterway. The senate bill, briefly outlined, gives authority to the Maritime Canal Company of Nicaragua to issue 3 per cent. bonds to the amount of $70,000,000, which shall be endorsed by the treasury of the United States and secured by a first mortgage on all the property of the company. The reorganized canal company is to be capitalized at $100,000,000, the shares numbering 1,000,000 and the value $100 each. In consideration of the guarantee, the United States is to receive $70,000,000 in stock of the company, while $6,000,000 of stock is to go to the government of Nicaragua, $1,500,000 to the government of Costa Rica, and the remaining $22,500,000 is to go to extinguish former issues of stock, and to the construction of the canal. Ten of the fifteen directors of the company are to be appointed by the president of the United States, with the advice and consent of the senate. The canal work is to be divided into ten sections, contracts for each section to be given out under competitive bids. Interest on the bonds is to be paid by the company as it falls due, and on failure to do so, is to be held to pay 4 per cent interest to the United States, and such default shall also bring with it the right of foreclosure and sale. The fate of the measure in the house is, of course, uncertain, but it is well known that the administration is favorable to it on general principles.

ANOTHER EFFORT is being made at Washington to pass in the house the Frye bill for the equalization of salaries of steamboat inspectors, which was passed by the senate at the last session. It is well known that this bill, which reduces salaries of local and supervising inspectors in districts where little work is performed, and increases the compensation in places where of late years the number of steam vessels has greatly increased, is in every way a just measure, having the endorsement of the secretary of the treasury and the supervising inspector-general, but some influence in the lower house of congress prevents its adoption. Adjournment is drawing near, but it is to be hoped that Representatives Mallory and Stevenson, who have caused a renewal of interest in the bill, will manage to soon bring it before the house, as there can be little doubt of its passage if an opportunity is afforded for a proper explanation of its provisions.

THE policy inaugurated by the Cleveland Chamber of Commerce, of having the city appropriate money for harbor improvements on a scale proportionate to the work of the general government in outer harbors and connecting waters of the lakes, is wise in every particular. New York state has spent vast sums of money on the Hudson river, and cities of Albany and Troy have supplemented the work of the state with special improvements in their immediate vicinity. The lake ports that are first to move in this direction will reap the earliest and greatest advantages of the 20-foot waterway throughout the lakes.

COMMODORE MELVILLE'S term as engineer-in-chief of the navy does not expire until August next, but it is stated on very good authority that President Cleveland will re-appoint him to the position. There will certainly be no objection to the president's action. To Commodore Melville's administration of affairs in the bureau of which he is chief is due many noteworthy achievements in the engineering line, and his success has been commended in Europe as freely as at home.

ONE OF THE American line greyhounds, the New York, is again at Newport News, Va., receiving an overhauling. Facilities for docking and repairing American ships, as well as provision for manning and equipping them, will undoubtedly keep pace with all progress made in the ship building industry.

The following report of ship building on the Pacific coast, prepared by Mr. Ed. Rosenberg, manager of the Coast Seaman's Journal, was received too late to be included in the REVIEW'S annual report of ship building: The Fulton Engine and Ship Building Works, San Francisco, Cal., is building a fishing steamer 75 feet long, and a tow boat 78 feet long, each to cost $25,000. At Turner's yard San Francisco Cal., there are building three gasoline schooners, one for the Ycara Gold Mining Company, Mexico, 85 feet long, and two smaller ones on builder's account. There are also under construction at this yard two stern-wheel steamers for the Alaska Commercial Company, one 162 feet long and the other 60 feet. These five vessels at the Fulton works are valued at $47,000.

Calculations on Horse Power or Speed of Ships.

Reference was made in these columns recently to a paper of exceptional merit, read at a meeting of one of the engineering societies of Great Britain by Engineer-in-Chief Durston of the British navy. Mr. Durston's paper was valuable mainly on accouut of the great amount of official statistics which it contained regarding naval vessels built by the British government during the past few years. A naval engineer writing for the New York Sun summarizes these statistics with a view to showing that in foreign countries, as well as our own, it is never easy to calculate with much surety on the exact horse power or speed a ship will show.

Under the British naval defense act of 1889 there were built seventy vessels, including ten battle ships, nine first class cruisers, twenty-nine second-class cruisers, four third-class cruisers, and eighteen torpedo gunboats. These vessels had, of course, profited by the changes in steam machinery of the previous half dozen years, including the substitution of steel for iron tubes in the boilers, just as iron had superceded brass. and of three-cylinder, triple expansion, for the two-cylinder engines.

Of the seventy vessels in question, the government built the hulls of thirty-eight and the machinery of seven, while private contractors supplied the hulls of thirty-two and the machinery of sixty-three. Under the British system the horse power trials for new machinery include eight consecutive hours at sea with natural and four hours with forced draft, the speed being noted on the patent log, but forming no part of the acceptance conditions. Speed trials proper, which are not always exacted, are obtained from the mean of at least three consecutive runs on measured miles. In sister ships, after the acceptance trials, at least one of each class is run for speed at the deep load line, but it is considered a useless expense to run all in that way where acceptance is not involved. This system is quite different therefore from ours.

For the ten battle ships the horse power exacted was 9,000 under natural and 13,000 under forced draft, the latter afterward restricted to 11,000 except in three cases, by so arranging the valves. Eight ships were of 14,150 tons displacement, and two—the Barfleur and Centurion—of 10,500. All surpassed the 9,000 natural draft, the lowest being 9,220 and the highest 9,934; and in like manner the forced drafts varied from 11,315 to 11,-625, except in the three cases spoken of, where the valves were allowed to develop from 13,019 to 13,214. The closeness of calculation is evident. But the speeds varied much more. The estimate was sixteen knots under natural draft, except for the Barfleur and Centurion, in which it was seventeen. The two latter made 17.16 and 17½, while the Empress of India and Hood, with 9,508 and 9,540 natural draft horse power respectively, reached only 15¾ knots each, whereas the Resolution, Revenge, and Royal Oak, with 9,248, 9,220, and 9,235, reached 16.7, 17.3 and 16.5 respectively, and the Repulse, with 9,588, reached 17.78. On the other hand, the Royal Sovereign, with 9,661, reached but 16.77.

Under forced drrft similar discrepancies were shown. There the expectation was 17½ knots but the Hood, with 11,446 horse power, reached only 17 knots, whereas the Repulse, with 11,315, reached 18.2 knots, and, on the other hand, the Royal Sovereign, with 13,019, reached 18.01. The Barfleur and Centurion, with 13,163 and 13,214 actual forced draft, reached 18.25 and 18.51 knots respectively.

Turning to the nine first-class cruisers, all either of 7,350 or 7,700 tons, they exceeded by from 86 to 956 the 10,000 natural draft horse power expected of them. But the speeds varied greatly under this draft. Thus the Endymion, with 10,662 horse power, made 20.96 knots, and the Hawke, with 10,761, made 19½, both having 7,350 displacement and both being expected to develop 17¾ knots. Some of these vessels would have earned heavy speed premiums under our system.

Again, the twenty-nine second-class cruisers, varying from 3,400 to 4,360 tons, but all designed for 7,000 horse power under natural and 9,000 under forced draft, showed great variations. The lowest excess under natural draft was 34 and the highest 879; but the Sappho, with 7,301, reached 19.41 knots, and the Scylla, with 7,614, reached but 18.5, both being of the same displacement and built by the same builders. Under forced draft the Scylla yielded 9,618 and the Sirius 9,280 horse power, but the speeds were 20.47 and 20.62 respectively.

These are only random examples of the curious results. Of course, there may have been variations in circumstances of trials not calculated as carefully as under our system of speed premiums. Then in some cases there is a difference in builders, and there may be greater fairing of the lines or smoother hulls in some cases. But in general it is evident that the element of the unexpected is present in foreign countries as in ours, giving a speed trial of vessels all the excitement and uncertainty of any other race against time or distance, and in this country sometimes involving more than the stakes of a horse race. The steam trials of other navies suggest the same points. Taking, for example, recent French torpedo boats, we find the contract speed of the Argonaute, 23½, and her actual speed 25.1; the corresponding speeds of the Chevalier, 24½ and 27.22; of the Dragon, 20½ and 25.03; of the Lancier, 20½ and 25.79; of six other craft, 21 knots by the contract, and 24.16, 24.26 23.76, 23.15, 24.38 and 22.80 respectively. In Germany we find the Worth making 10,227 horse power on a contract calling for 8,000, and the Brandenburg 9,640 on one of 8,000.

Great Collection of Literature on Water Transportation.

The greatest collection of literature on subjects pertaining to water transportation ever made up in this country has just been published under the direction of William Watson, Ph. D., 107 Marlborough street, Boston, Mass. Prof. Watson was general secretary of the water commerce congress, held in connection with the World's Columbian Exposition at Chicago, and although he has been delayed in compiling a report of the congress and putting into print all of the papers, the result of his labor fully justifies the detention. The papers are from the highest authorities in different parts of the world, as the following list of those printed in full in connection with the report will show:

"Chain Towage with Magnetic Adherence," by L. Molinos, of Paris, past president of the Society of Civil Engineers of France; "Electric Propulsion on Canals," by O. Buesser, Oderberg-in-the Mark, Prussia; "Experimental Researches on the Forms of Canal and River Boats," by F. B. Mas, chief engineer of roads and bridges, Paris, France; "The Proposed Enlargement of the Waterway from Lake Michigan to the Mississippi River via the Illinois River," by L. E. Cooley, civil engineer of Chicago, and chief of the drainage canal engineers; "Canadian Waterways from the Great Lakes to the Atlantic," by Thos. C. Keefer of Ottowa, Can., past president American Society Civil Engineers; "The Proposed Waterway from Lake Michigan to the Mississippi River, via the Illinois and Mississippi Canal," by Thos. J. Henderson, of Princeton, Ill., member of congress; "The proposed waterway from Lake Michigan to the Mississippi River, via the Illinois and Mississippi Canal" by Alonzo Bryson, Davenport, Iowa; "The New and Enlarged Waterways Required to Meet the Demands of Commerce in Russia," by E. F. De Hoerschelmann, engineer of lines of communication, Kief, Russia; "The Projected Lake Erie and Ohio River Ship Canal," by Thomas P. Roberts, civil engineer of Pittsburgh, Pa.; "On the Utilization of Water and Rail Routes in Hungary and Their Competitive Influence in Reducing Freight Charges," by Dr. Alexander Halasz, professor in the polytechnic school at Buda-Pest; "The Benefits to be Derived from the Improvement of Waterways (Ship Canals)," by Leveson Francis Vernon-Harcourt, of London, member British Institute of Civil Engineers; "The Nicaragua Canal," by A. G. Menocal, chief engineer of the Nicaragua Canal Company; "The Manchester Ship Canal," by Elijah Helm, secretary of the Manchester chamber of commerce; "The Working of the First Ship-Railway," by William Smith of Aberdeen, Scotland, member British Institute of Civil Engineers; "The Chignecto Ship Railway," by H. G. C. Ketchum, chief engineer of the Chignecto ship Railway, Amherst, Nova Scotia; "Mississippi River Improvement Below Cairo," by C. B. Comstock, colonel of engineers brevet brigadier-general, U. S. A.; "The Port of Havre," by Baron Quinette De Rochemont, Paris, France; "The Commerce of the Mississippi River," by George H. Morgan, secretary of the merchants' exchange of St. Louis, Mo.; "The Commerce of the United States as Related to that of Other Countries," by William W. Bates of Chicago, ex-commissioner of navigation; "The Status and Interests of Water Transportation," by Thomas J. Vivian, superintendent of transportion, eleventh United States census.

Under different divisions in the work of the congress, the secretary, Prof. William Watson of Boston, presented papers dealing with "Cable Towage on Canals and Rivers," "The Hydraulic Canal Lift at Fontinettes, France," "Navigation of the Seine from Paris to the Sea" and "Pneumatic Foundations for Harbor Works at Genoa and Rochelle." There is also among the papers a pamphlet of about twenty pages, presented by the Nicaragua Canal Company and devoted to that company's big project. In the proceedings of the congress, which contain reference to discussion on the papers, there is reported in full the address of S. A. Thompson of Duluth, Minn., on the "Economic Value of a Ship-Canal from the Great Lakes to the Sea," and a letter from Ambrose Snow, president of the American Shipping League of New York, on the "Present Condition of Foreign Commerce of the United States."

Hon. John C. Dore, ex-president of the Chicago board of trade, was chairmen of the congress, and E. L. Corthell, civil engineer, also of Chicago, was vice-chairman. The proceedings have been published by Damrell & Upham of Boston, Mass., and are sold at $5.

In the new catalogue of the Penberthy Injector Co., Detroit, Mich., two pages are devoted to facts not generally known about injectors. Hot feed water, hot delivered water, and water supply from pressure are the subjects discussed The book contains deccriptions and price lists of a number of new water gauges and oil cups that this company is placing on the market. Any engineer who cares for a copy of the catalogue can have it by writing the Penberthy company and mentioning the MARINE REVIEW.

The Acme White Lead and Color Works of Detroit has adopted a novel plan of directing the attention of lake vessel owners to the advantages of its marine paints and varnishes. A calendar issued monthly contains each month a new illustration of a lake vessel or a marine scene of some kind. A very neat picture of the launch of the Northern line passenger steamer North Land accompanies the February calendar.

Capt. Kendricks, whose last command on the lakes was the steamer David W. Rust, died at his home in Cleveland, Thursday, aged sixty-eight years. His career on the lakes was remarkable. He never had a serious accident.

U. S. ENGINEER OFFICE, 34 WEST CONgress St., Detroit, Mich., January 30, 1895. Sealed proposals for furnishing all labor, materials and appliances for A, Removing Portions of a Shoal at the Upper End of Hay Lake Channel and for B, Cleaning up Shoals near Nine Mile Point, Hay Lake Channel will be received here until 2 p.m. March 1, 1895, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application. O. M. POE, Col., Corps of Engineers, U. S. A., etc. Feb. 21.

U. S. ENGINEER OFFICE, HICKOX BUILDING, 185 Euclid Avenue, Cleveland, Ohio, Jan. 17, 1895. Sealed proposals for furnishing and delivering timber, iron and stone, for construction of Pier at Conneaut Harbor, Ohio, will be received here until 2 o'clock p.m. standard time, Tuesday, February 12, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut.-Col., Eng'rs. Feb. 12.

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio. Jan. 21, 1895. Sealed proposals for Extension of Piers, Improving Harbors at Huron, and at mouth of Black River, Ohio, will be received here until 2 o'clock p.m. standard time Tuesday, February 12, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut.-Col., Eng'rs. Feb.12.

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio, Jan. 18, 1895. Sealed proposals for furnishing and delivering timber and iron for Repair of Pier at entrance to Monroe Harbor, Mich., will be received here until 2 o'clock p.m. standard time. Tuesday, February 12, 1895, and then publicly opened. All information furnished on application to JARED A. SMITH, Lieut.-Col., Eng'rs. Feb. 12.

COMPARATIVE STATEMENT OF TONNAGE AND SHIPMENTS.

TONNAGE BUILT ON THE LAKES, AND INCREASE OF LAKE SHIPMENTS, AS INDICATED BY THE CHIEF COMMODITIES, ORE AND GRAIN.

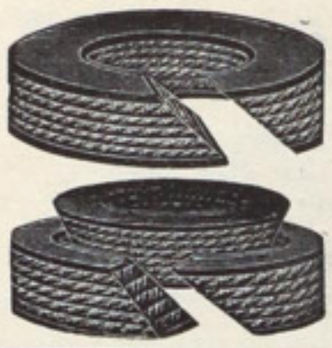
Year.	Total Tonnage of Vessels built on the Lakes each Year. Net Registered Tons.	Iron Ore Production of Lake Superior region—chiefly shipped by Lake. Gross Tons.	Tons of Freight of all kinds passing through the Sault Canal, up and down. Net Tons.	Grain Receipts, Bushels.
----	--------	----------	--------	{ Prior to 1848 a74,382,242 }
1848	--------	----------	--------	a14,641,012
1849	--------	----------	--------	a14,665,183
1850	--------	----------	--------	a12,059,556
1851	--------	----------	--------	a17,740,781
1852	--------	----------	--------	a20,390,504
1853	--------	----------	--------	a15,956,526
1854	--------	----------	--------	a22,252,235
1855	--------	----------	*8,183	a24,472,278
1856	--------	----------	*24,828	a25,763,907
1857	51,498	----------	*40,792	a10,578,690
1858	31,642	----------	*46,258	a26,812,890
1859	6,180	----------	*93,614	a21,530,622
1860	11,992	----------	*137,731	a37,053,115
1861	23,467	----------	*72,891	a61,640,601
1862	53,804	----------	*141,295	a72,872,454
1863	67,972	----------	*202,624	a64,735,520
1864	49,151	----------	*245,566	a51,177,146
1865	36,641	----------	*168,555	a51,415,183
1866	33,204	----------	*204,993	a58,388,087
1867	39,679	----------	*257,258	a50,168,064
1868	56,798	----------	*263,879	a50,197,215
1869	49,460	----------	*322,508	a45,489,276
1870	37,258	----------	x497,485	a45,477,094
1871	43,897	----------	x503,017	a67,259,158
1872	44,611	----------	x617,702	a62,550,566
1873	92,448	----------	x756,652	a70,262,520
1874	91,986	----------	x597,028	b70,108,856
1875	29,871	----------	x750,844	b64,213,212
1866	16,124	{ Prior to 1878 }	x934,678	b54,638,225
1877	8,903	{ 10,426,842 }	x812,159	b71,443,360
1878	11,438	1,111,110	x793,339	b93,082,950
1879	15,135	1,375,691	x874,509	b86,132,793
1880	22,899	1,908,745	x1,113,212	b124,754,573
1881	73,504	2,307,005	1,567,741	b68,020,214
1882	58,369	2,965,412	2,029,521	b66,596,338
1883	28,638	2,352,840	2,267,105	b81,591,833
1884	30,431	2,508,693	2,874,557	c86,372,154
1885	26,826	2,516,642	3,256,628	c77,960,819
1886	20,400	3,559,371	4,527,759	c118,874,151
1887	56,488	4,742,276	5,494,649	c123,682,373
1888	101,103	5,046,503	6,411,423	c119,701,692
1889	107,080	7,292,644	7,516,022	c149,816,209
1890	108,526	9,003,701	9,041,213	c153,838,795
1891	111,856	7,057,078	8,888,759	c198,686,061
1892	45,969	9,074,243	11,214,333	c222,653,806
1893	99,271	6,058,955	10,796,572	c237,688,195

Sault Canal Tonnage.

* Not including wheat, lumber, or unclassified freight.
x Including wheat, but no lumber or unclassified freight.

Grain Receipts.

a Buffalo receipts; *b* Buffalo, including Erie receipts; *c* Buffalo and Erie receipts, and Welland Canal passages.



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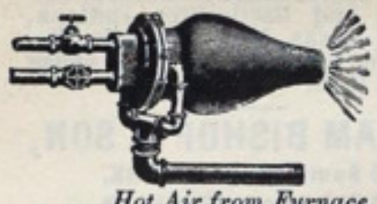

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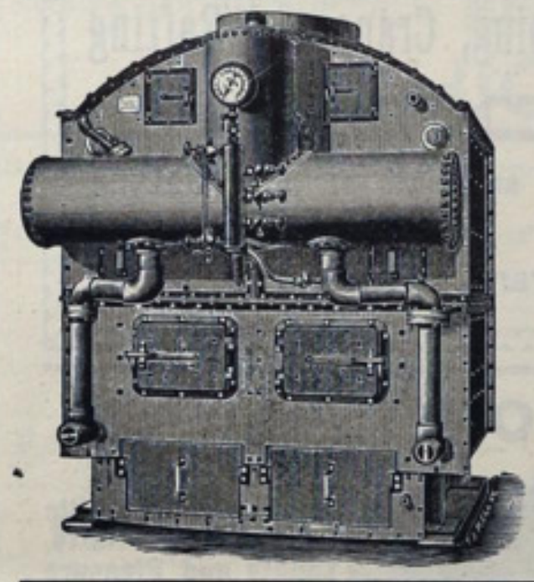

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The small charge of $1 will be made for tieing up at the dock, for each 24 hours or fraction thereof, for all classes of freight carriers.

They will keep a supply of fuel and ship stores of every description constantly on hand, and will have the dock lighted at night and a bell sounded in thick weather. Masters finding themselves in this locality during thick or unfavorable weather of any kind, are invited to take advantage of the accommodations offered. At out-port of customs and postoffice have been established.

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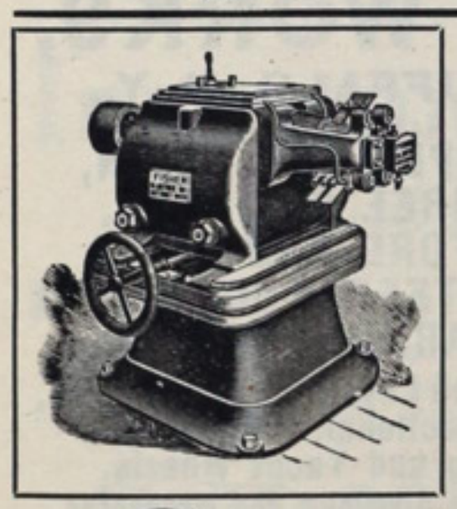

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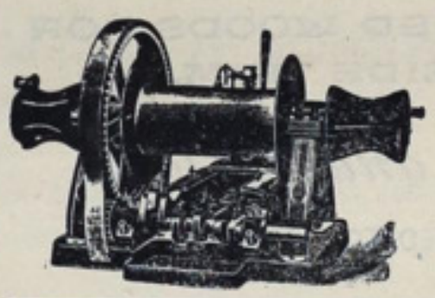

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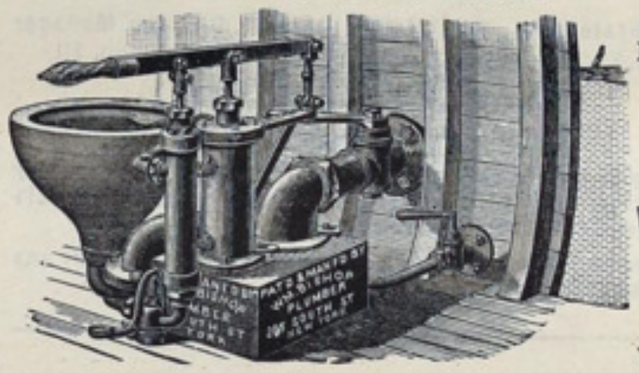

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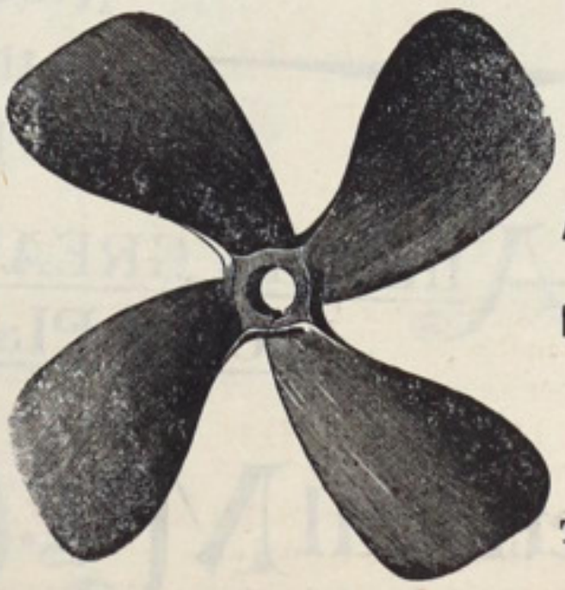

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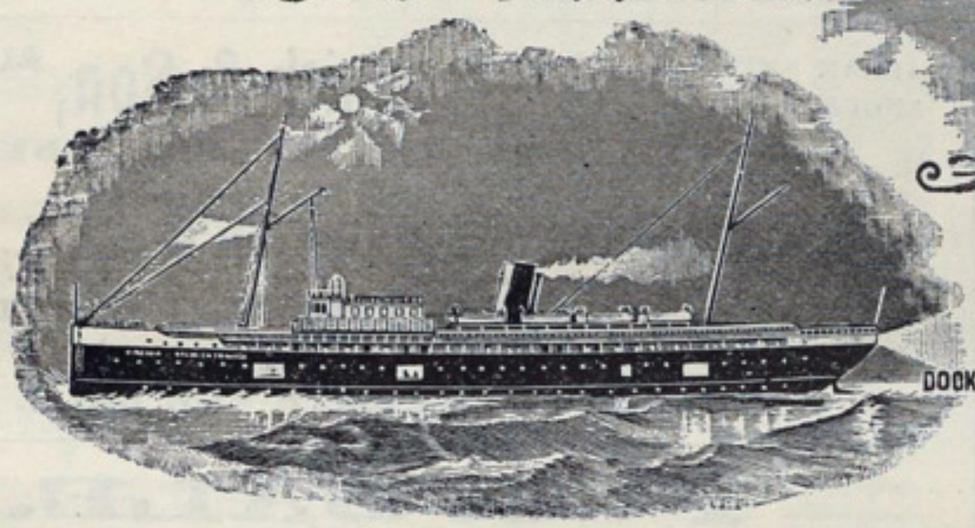

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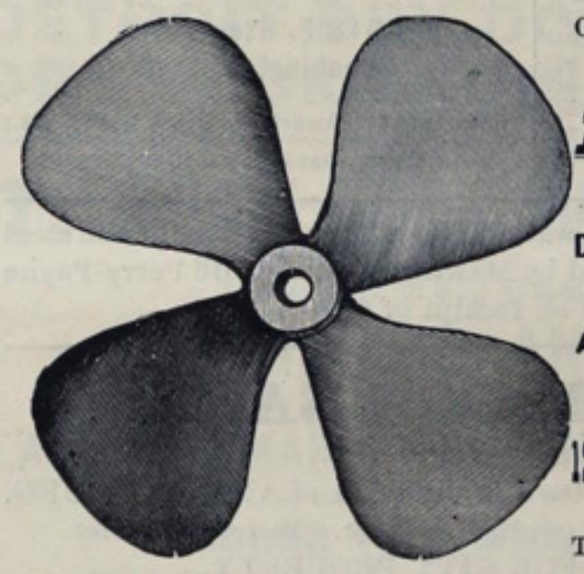

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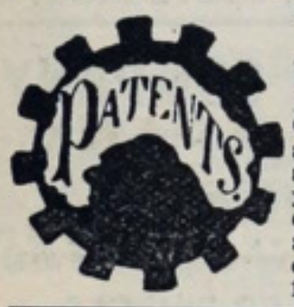

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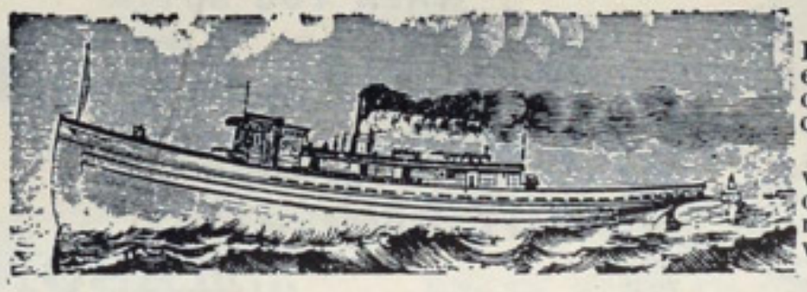

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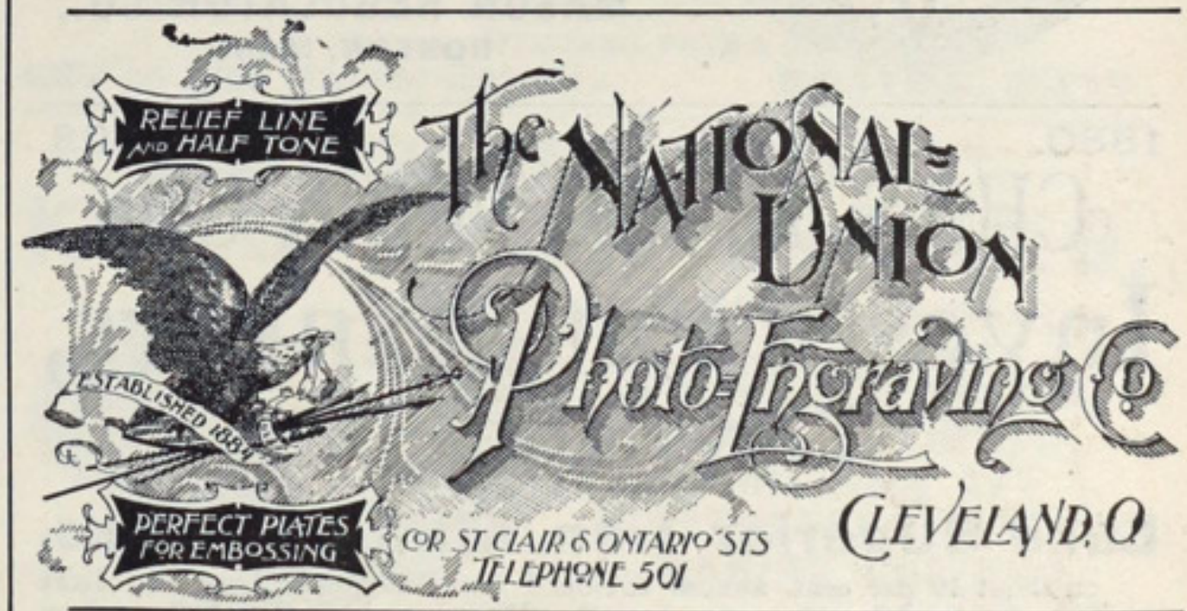

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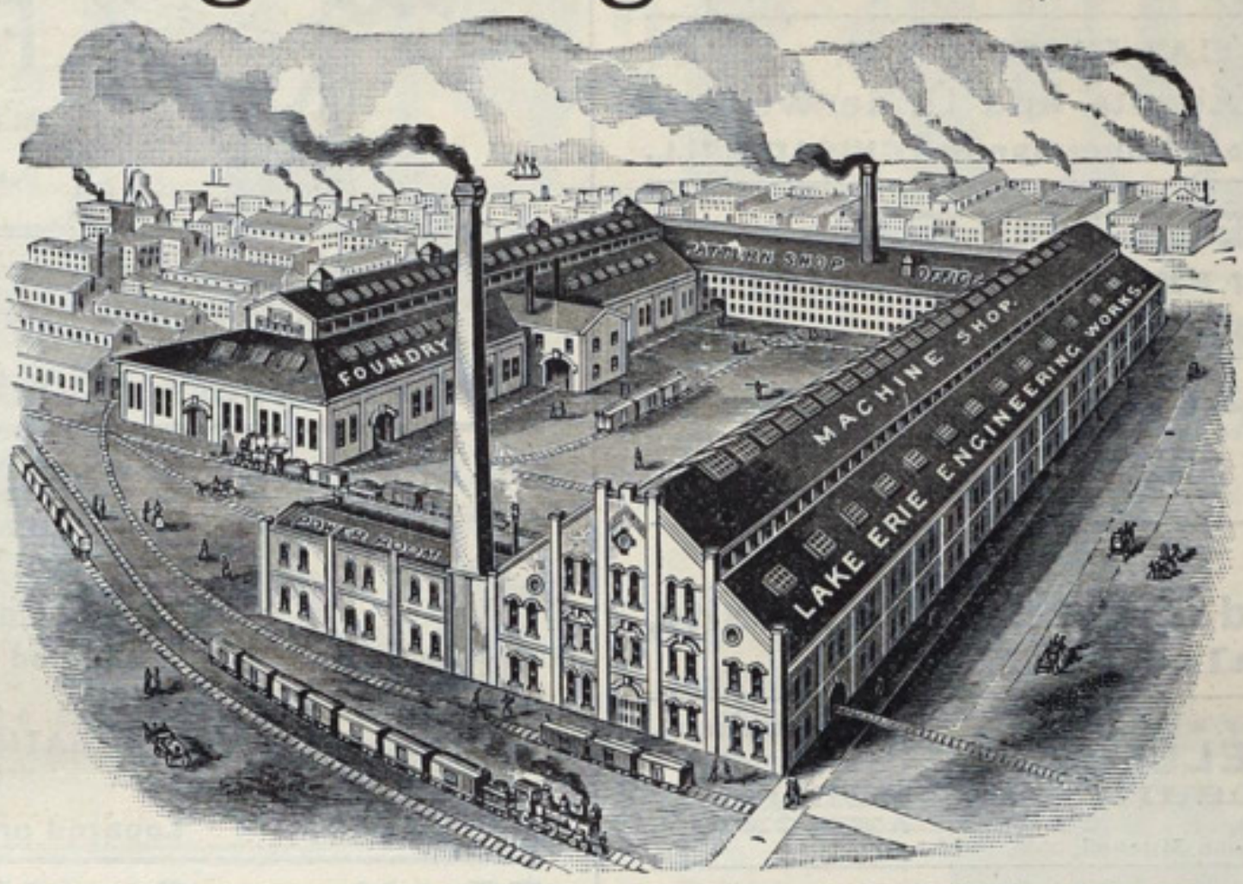

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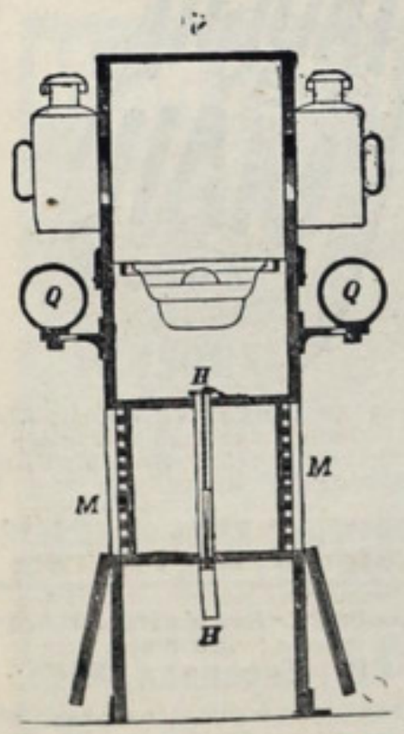

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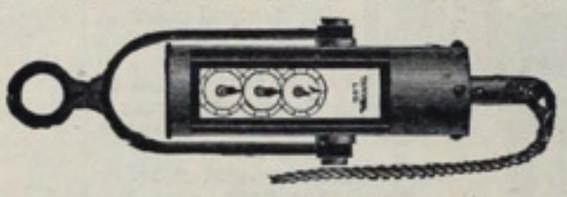

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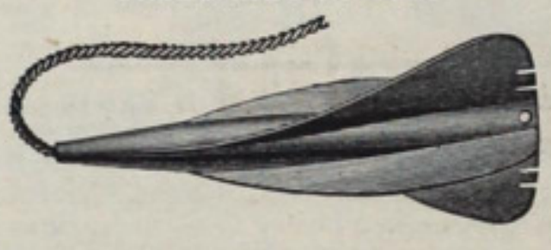

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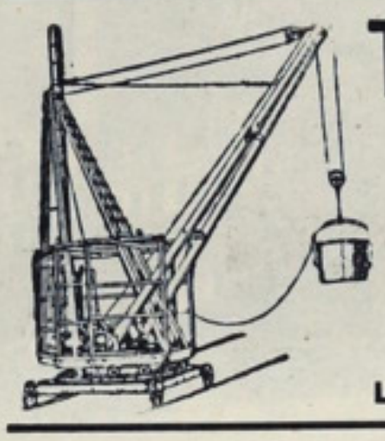
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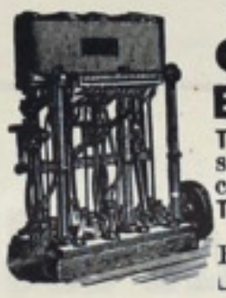
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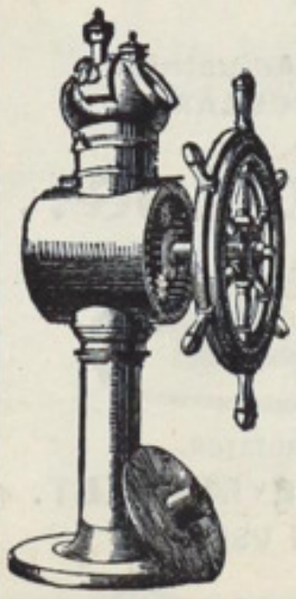
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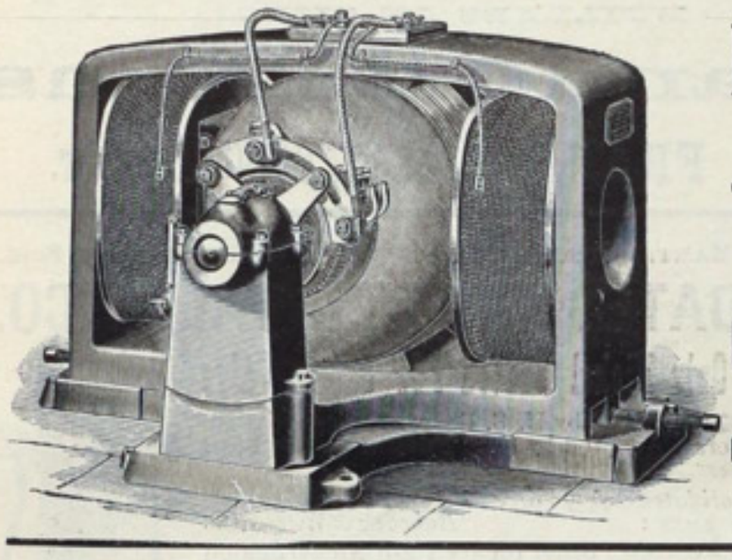

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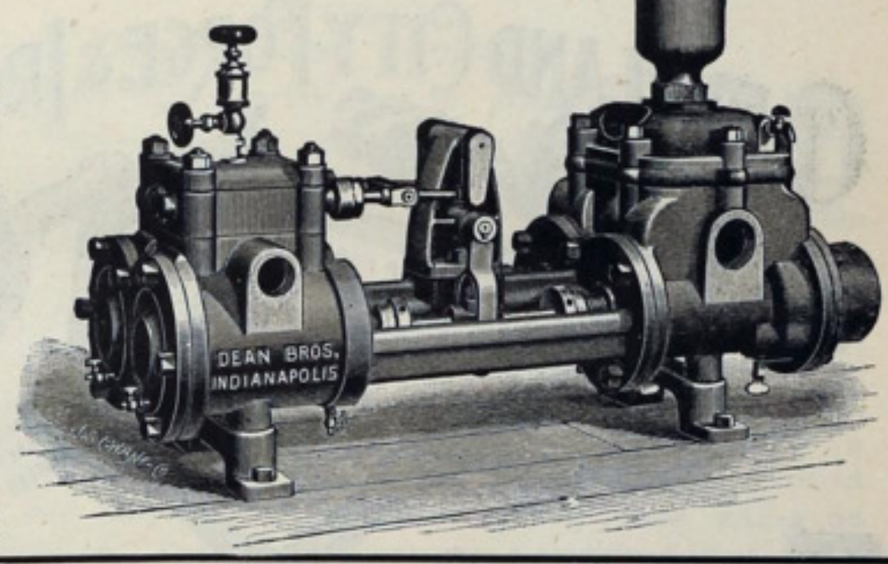

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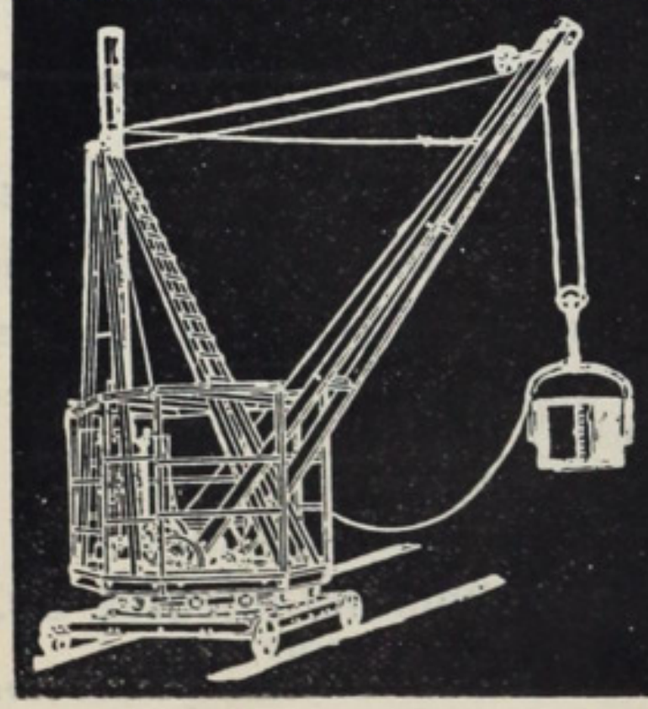

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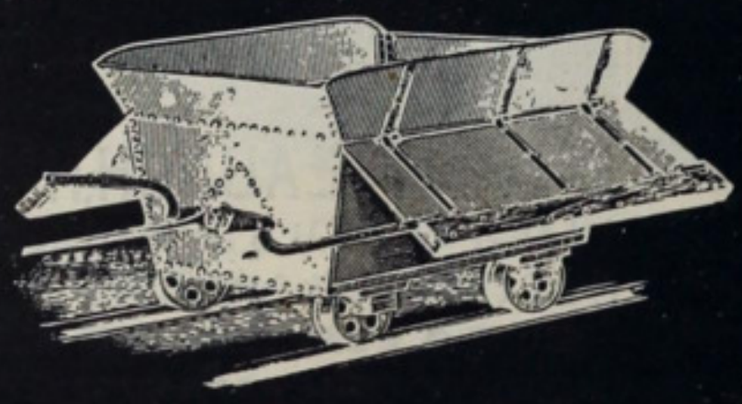

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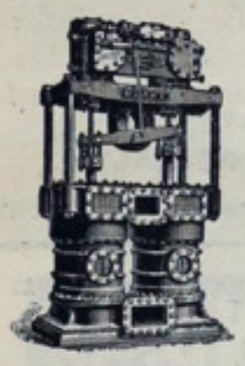

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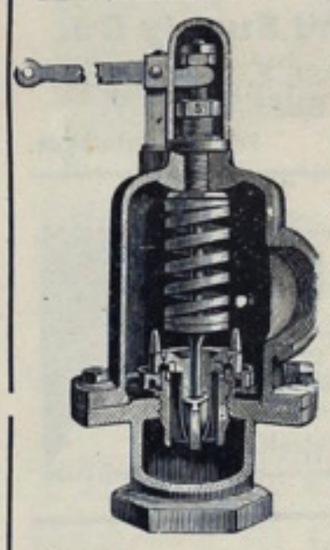

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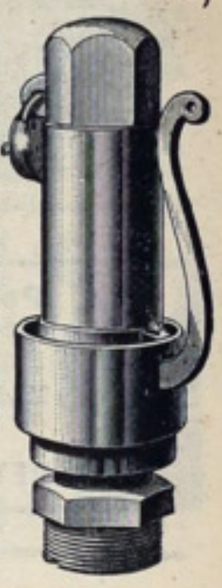
The enclosed order for sixty (60) Nickel Seated Safety Valves is for the Spreckels Sugar Refinery, of Philadelphia. In looking over our books we find that, counting this order, we have used **1,725 of your valves** to date of the 3", 3½", 4", 4½" sizes, without a **single failure** to fulfill all the statements made by you when we bought the first valve in 1882. We could ask for **nothing better**, and the **absolute satisfaction** which they give to ourselves and our customers only proves once more that the highest priced goods are really the cheapest.

Yours truly, THE BABCOCK & WILCOX CO.
NAT. W. PRATT, Treas.

Salesroom, 111 Liberty St., N. Y.
WORKS, BRIDGEPORT, CONN.



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Straight inclined tubes with water level above their upper ends.

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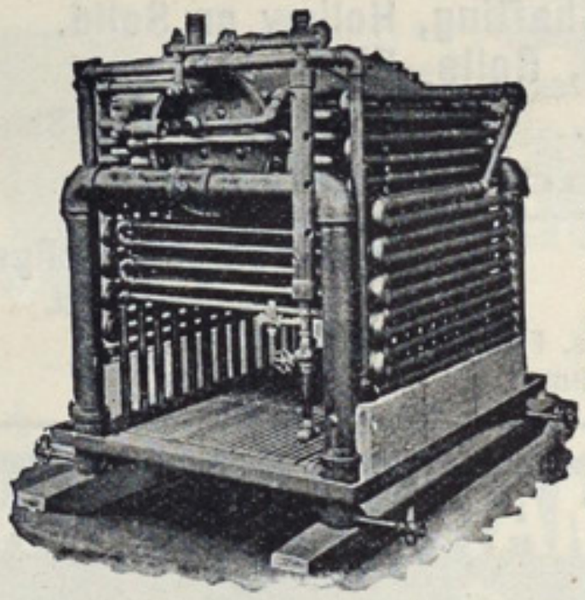

For YACHTS, LAUNCHES and other Steamers.

THE ORIGINAL FIXED WATER LINE PIPE BOILER.

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NEARLY 600 IN USE.

SAFE, RELIABLE, SIMPLE, LIGHT WEIGHT, ECONOMICAL, NO SHOP REPAIRS, SMALL SPACE. Send for ILLUSTRATED PAMPHLET and other reading matter, with hundreds of enthusiastic letters from purchasers and engineers.

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WARD BOILERS FOR STEAMERS LARGE OR SMALL

LIGHT WEIGHT, GREAT POWER

THREE TYPES.

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ADOPTED BY U.S. GOVERNMENT. WAR VESSELS, LAUNCHES, REVENUE CUTTERS, TUGS.

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In Use on 1000 Lake Steamers.

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LIFE AND PROPERTY ARE ENDANGERED BY THE USE OF CHEAP BOILER APPLIANCES.

...THE PENBERTHY STEAM SPECIALTIES ARE SAFE BECAUSE WELL MADE AND THOROUGHLY TESTED.

PENBERTHY Automatic Injector. Valve Drip Water Gauge, Safety Crank Pin Oiler, Etc.

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